MINERALOGICAL ABSTRACTS

VOLUME 29
1978

PRINCIPAL EDITOR
R. A. HOWIE

EDITORS
C. M. B. HENDERSON, P. BROWNE

INDEXERS
A. M. and L. J. CLARK

SUB-EDITORS

DR. T. W. BLOXAM
MR. R. J. L. COLVINE
MISS E. E. FEJER
DR. A. L. GRAHAM
DR. R. K. HERD
DR. E. R. C. KEMPE
DR. W. J. McHARDY
DR. D. J. MORGAN
DR. I. PARSONS
DR. J. A. PLANT

ORGANIZERS OF ABSTRACTS

Great Britain:
DR. C. M. B. HENDERSON,
Dept. of Geology,
The University
Manchester, M13 9PL.

America:
DR. R. V. DIETRICH,
Dept. of Geology,
Central Michigan University,
Mount Pleasant,
Michigan 48859

Argentina:	DR. M. A. LEVERATTO, Dept. de Geologia, Univ. De Buenos Aires.
Australia:	DR. J. A. HALLBERG, C.S.I.R.O., Min Res. Laboratories, P.O. Wembley, Western Australia 6014
Austria:	PROF. H. G. SCHARBERT, Mineralogisch-Petrographishes Institut, Universität Wien.
Belgium:	DR. R. VAN TASSEL, Institut Royal des Sciences Naturelles, Brussels.
Bulgaria:	PROF. IV. KOSTOV, Chair of Mineralogy, University of Sofia.
Canada:	PROF. L. G. BERRY, Queen's University, Kingston, Ontario.
Czechoslovakia:	PROF. DR. M. KODĚRA, Katedra Min. Kryšt., University Komenského, Bratislava.
Denmark:	MR. OLE JOHNSEN, Mineralogisk Museum, Ostervoldgade 5–7.
Egypt:	DR. E. M. EL SHAZLY, Geological Society of Egypt, 1 Elhamny St., Kasr El Doubara, Cairo.
Finland:	DR. M. LEHTINEN, University of Helsinki, SF-00171, Helsinki-17.
Germany:	DR. ISA KUBACH, Joachim Becherstrasse, 2 Frankfurt-am-Main.
India:	DR. V. K. NAYAK, Centre of Advanced Study in Geology, Univ. Saugar.
Israel:	DR. DAN H. YAALON, The Hebrew University of Jerusalem.
Italy:	PROF. EDOARDO SANERO, Istituto di Mineralogia e Petrografia, Universitá di Genova.
Japan:	DR. ICHIRO SUNAGAWA, Inst. Min. Petr. & Econ. Geology, Tohoku Univ., Sendai.
Netherlands:	DR. R. O. FELIUS, Geol. & Min. Inst., Garenmarkt 1b, Leiden.
New Zealand:	DR. G. A. CHALLIS, N.Z. Geol. Survey, P.O. Box 30368, Lower Hutt.
Norway:	PROF. I TH. ROSENQVIST, Institutt for Geologi, Universitetet, Oslo.
Pakistan:	DR. K. A. BUTT, Atomic Energy Minerals Centre, Ferozipur Rd., Lahore.
Portugal:	PROF. L. A. A. BARROS, Lab. de Minerologia y Petrologia, Av. Rovisco Pais, Lisboa I.
South Africa:	PROF. H. V. EALES, Dept. of Geology, Rhodes University, Grahamstown.
Spain:	DR. R. RODRIGUEZ CLEMENTE, Dept. Crystalografia y Mineralogia, Universidad, Barcelona.
Sweden:	DR. B. LINDQVIST, Mineralogisk Geol. Inst., Uppsala.
Switzerland:	PROF. DR. TH. HÜGI, Mineralog-Petrograph. Institut, Sahlistrasse 6, Bern.

PUBLISHED JOINTLY BY

HE MINERALOGICAL SOCIETY OF GREAT BRITAIN AND THE MINERALOGICAL SOCIETY OF AMERICA

LONDON–1979

CONTENTS

Age determination	78-1, 1328, 2478, 3790
Apparatus and techniques	78-69, 1388, 2534, 3853
Book notices	78-119, 1428, 2587, 3897
Clay minerals	78-137, 1437, 2603, 3913
Crystal structure	78-190, 1476, 2686, 3997
Economic minerals and ore deposits	78-264, 1522, 2753, 4071
Environmental mineralogy	78-334, 1588, 2825, 4169
Experimental mineralogy	78-353, 1620, 2837, 4183
Gemstones	78-476, 1707, 2971, 4447
Geochemistry	78-493, 1730, 3000, 4492
Lunar studies	78-642, 1872, 3226, 4649
Meteorites and tektites	78-721, 1956, 3313, 4740
Mineral data	78-754, 2007, 3357, 4786
New minerals	78-879, 2116, 3469, 4918
Petrology	78-900, 2131, 3484, 4936
Physical properties of rocks and minerals	78-1174, 2381, 3693, 5190
Topographical mineralogy	78-1222, 2405, 3710, 5224
Various topics	78-1264, 2439, 3759, 5261

Place-names are, in general, in the form used in the Columbia-Lippincott Gazetteer of the World (1952 edition); alternative forms are given on occasion.

Grateful thanks are due to those readers who have notified us of errors in volume 29 of *Mineralogical Abstracts*.

ORGANIZATION OF ABSTRACTS

Arising from a decision taken at the meeting of the INTERNATIONAL MINERALOGICAL ASSOCIATION in Copenhagen 1961 the Mineralogical Societies of America and Great Britain agreed to issue a joint statement to National Societies adhering to Association inviting each Society to organize contributions of abstracts of papers published in the journals of its country on jects relevant to *Mineralogical Abstracts*. This invitation was issued and has brought a gratifying response. Members of Societies ich have agreed to co-operate in this way are entitled to receive *Mineralogical Abstracts* for their personal use at a reduced rate subscription on application, *which must be made through their National Society*. The countries now co-operating include: USTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CZECHOSLOVAKIA, DENMARK, EGYPT, FINLAND, ERMANY, INDIA, ISRAEL, ITALY, JAPAN, NETHERLANDS, NEW ZEALAND, NORWAY, PAKISTAN, ORTUGAL, SPAIN, SWEDEN, SWITZERLAND. Individual mineralogists and petrologists in countries not represented the Association, or not yet co-operating through their National Society, provide abstracts from the literature of ARGENTINA, RAZIL, KENYA, MEXICO, and SOUTH AFRICA.

ABSTRACTORS

ntributors to this volume of *Mineralogical Abstracts* are:

Agrell, J. E. (J.E.A.), *Gt. Britain*; Akizuki, M. (M.Ak.), *Japan*; Alabaster, C. J. (C.J.A.), *Gt. Britain*; Atkins, F. B. (F.B.A.), *Gt. Britain*; Ball, F. (D.F.B.), *Gt. Britain*; Barnes, J. H. (J.H.B.), *U.S.A.*; Aires Barros, L. (L.A.B.), *Portugal*; Bayliss, P. (P.B.), *Canada*; Beran, A. (A.B.), *stria*; Berg, R. B. (R.B.B.), *U.S.A.*; Bishop, A. C. (A.C.B.), *Gt. Britain*; Blank, H. R. (H.R.B.), *U.S.A.*; Botinelly, T. (T.B.), *U.S.A.*; Bowes, R. (D.R.B.), *Gt. Britain*; Bridge, P. J. (P.J.B.), *Australia*; Browne, P. (P.Br), *Gt Britain*; Butler, B. C. M. (B.C.M.B.), *Gt. Britain*; Butt, K. A. A.B.), *Pakistan*; Carpenter, A. B. (A.B.C.), *U.S.A.*; Chisholm, J. E. (J.E.C.), *Gt. Britain*; Colvine, R. J. L. (R.J.L.C.), *Gt Britain*; Crowley, P. (W.P.C.), *U.S.A.*; Cunningham, C. G. (C.G.C.), *U.S.A.*; Dietrich, R. V. (R.V.D.), *U.S.A.*; Dimmock, G. M. (G.M.D.). *Australia*; Dinnin, E. (J.I.D.), *U.S.A.*; Donaldson, C. H. (C.H.D.), *Gt. Britain*; Dubins, M. I. (M.I.D.), *U.S.A.*

Easton, J. (J.Ea.), *Gt. Britain*; Embrey, P. G. (P.G.E.). *Gt. Britain*; Fairburn, W. A. (W.A.F.), *Australia*; Finkelman, R. B. (R.B.Fm.), *U.S.A.*; sher, I. S. (I.S.F.), *U.S.A.*; Francis, C. A. (C.A.F.), *U.S.A.*; Frisch, T. (T.F.), *Canada*; Gable, D. J. (D.J.G.), *U.S.A.*; Galli, M. (M.G.), *Italy*; raghty, E. P. (E.P.G.), *U.S.A.*; Gill, G. S. (G.S.G.), *India*; Grybeck, D. (D.G.), *U.S.A.*; Gude, A. J. (A.J.G.), *U.S.A.*; Gupta, L. N. (L.N.G.), *dia*; Hall, A. (A.H.), *Gt. Britain*; Hallberg, J. A. (J.A.H.), *Australia*; Hartman, P. (P.H.), *Netherlands*; Hashimoto, M. (M.Ha.), *Japan*; ayashi, H. (H.H.), *Japan*; Henderson, C. M. B. (C.M.B.H.), *Gt. Britain*; Henderson, P. (P. He.), *Gt. Britain*; Herd, R. K. (R.K.H.), *Canada*; erzm N. (N.H.), *U.S.A.*; Hogarth, D. D. (D.D.H.), *Canada*; Horwitz, R. C. (R.C.H.), *Australia*; Howie, R. A. (R.A.H.), *Gt. Britain*; Hudson, C. (R.C.H.), *Australia.*

Jarkovský, J. (J.J.), *Czechoslovakia*; Jorgenson, D. B. (D.B.J.), *U.S.A.*; Kawai, T. (T.K.), *Japan*; Kempe, D. R. C. (D.R.C.K.), *Gt. Britain*; han, H. M. M. (H.M.M.K.), *India*; Kleeman, A. W. (A.W.K.), *Australia*; Koděra, M. (M.K.), *Czechoslovakia*; Kopp, O. C. (O.C.K.), *U.S.A.*; ubach, I. (I.Kb.), *Germany*; Lambert, I. B. (I.B.L.), *Australia*; Le Bas, M. J. (M.J.Le.B.), *Gt. Britain*; Leventhal, J.S. (J.S.L.), *U.S.A.*; Lewis, D. (J.D.L.), *Australia*; Lindqvist, B. (B.L.), *Sweden*; Love, L. G. (L.G.L.), *Gt. Britain*; Luedke, R. G. (R.G.L.), *U.S.A.*; Marvin, R. F. (R.F.M.), *S.A.*; Mason, B. (B.M.), *U.S.A.*; Mazzi, F. (F.M.), *Italy*; McCarthy, J. H. (J.H.M.), *U.S.A.*; Mélon, J. (J.M.), *Belgium*; Mereiter, K. (K.Me.), *ustria*; Micheelsen, H. (H.M.), *Denmark*; Michie, U. McL. (U.McL.M.), *Gt. Britain*; Miller, W. R. (W.R.M.), *U.S.A.*; Mitchell, R. S. (R.S.M.), *S.A.*; Miyahisa, M. (M.My.), *Japan*; Morgan, D. J. (D.J.M.), *Gt. Britain.*

Nafziger, R. H. (R.H.N.), *U.S.A.*; Nagasawa, K. (K.N.), *Japan*; Nayak, V. K. (V.K.N.), *India*; Nickel, E. H. (E.H.N.), *Australia*; Nicol, A. W. A.W.N.), *Gt. Britain*; O'Donoghue, M. J. (M.O'D.), *Gt. Britain*; Olsen, E. (E.O.), *U.S.A.*; Pabst, A. (A.P.), *U.S.A.*; Parsons, I. (I.P.), *Gt. Britain*; ettus, D. S. (D.S.P.), *U.S.A.*; Raade, G. (G.R.), *Norway*; Rea, W. J. (W.J.R.), *Gt. Britain*; Reynolds, R. L. (R.L.R.), *U.S.A.*; Rice, R. S. (R.S.R.), *S.A.*; Riggs, K. A. (K.A.R.), *U.S.A.*; Robinson, G. W. (G.W.R.), *U.S.A.*; Rosenblum, S. (S.R.), *U.S.A.*; Scafe, D. (D.S.), *Canada*; Scharbert, G. (H.G.S.), *Austria*; Shams, F. A. (F.A.S.), *Pakistan*; Sheppard, R. A. (R.A.S.), *U.S.A.*; Siegrist, M. (M.S.), *U.S.A.*; Siivola, J. U. (J.U.S.), *inland*; Starkey, H. C. (H.C.S.), *U.S.A.*; Steele, I. M. (I.M.S.), *U.S.A.*; Stephenson, N. C. N. (N.C.N.S.), *Australia*; Sunagawa, I. (I.S.), *Japan*; verjensky, D. A. (D.A.S.), *U.S.A.*

Taggart, J. E. (J.E.T.), *U.S.A.*; Tank, R. W. (R.W.T.), *U.S.A.*; Taylor, D. (D.T.), *Gt. Britain*; Thompson, A. B. (A.B.T.), *Gt. Britain*; Töpper, . (W.T.), *Germany*; Ueda, S. (S.U.), *Japan*; Van Tassel, R. (R.V.T.), *Belgium*; Watt, W. S. (W.S.W.), *Denmark*; Weibel, M. (M.W.), *witzerland*; Walsh, J. N. (N.W.), *Gt. Britain*; Wieseneder, H. I. (H.I.W.), *Austria*; Yamanaka, M. (M.Y.), *Japan*; Yates, D. C. (D.C.Y.), *U.S.A.*; oung, E. J. (E.J.Y.), *U.S.A.*; Žák, L. (L.Ž.), *Czechoslovakia*; Zemann, J. (J.Ze.), *Austria.*

ERRATA

Mineralogical Abstracts, vol. 29

78-234	*for* M.A. 30 *read* M.A. 4
78-727	*for* Mayo Bela *read* Mayo Belwa
78-884	*for* Caringbullite *read* Claringbullite
78-940	*for* Lock *read* Loch
78-1111	*page numbers are* 201–213
78-1693	*add at end* mechanisms.
78-1716	*for* Oitemann *read* Ottemann
78-1870	*for* assiciations *read* associations
78-1929	*for* relationships *read* relationship
78-2100	*for* makinawite *read* mackinawite
78-2162	*for* grenschist *read* greenschist
78-2757	*for* branite *read* granite
78-3256	*for* Hayes *read* Hays
78-3472	*for* Great Notch, New Jersey *read* Ore Knob mine, Jefferson, Ashe Co., North Carolina
78-3616	*for* Quarternary *read* Quaternary
78-3815	*for* meridan *read* meridian
78-3818	*for* Archean *read* Archaean
78-3957	*for* interlaying *read* interlayering
78-4080	*for* apatites *read* aplites
78-4628	*for vol. no.* 227 read 277
78-4745	*for* irradation *read* irradiation
78-4978 [7]	*for last line substitute* in the range 1050°–1250°C at 15 $\pm$ 3 kbar.
78-4978 [9]	*add at end* The principal result was that solubility of Al_2O_3 in enstatite is a great deal lower than hitherto reported: the authors obtained a carefully reversed data point at 30 kbar, 1500°C where Al_2O_3 in enstatite was 23% lower than hitherto believed.